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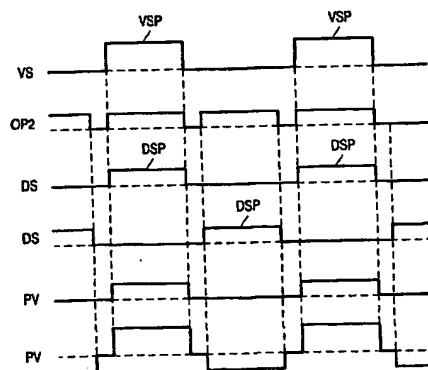
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[Continued on next page]

(54) Title: AN ELECTROLUMINESCENT DISPLAY



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B

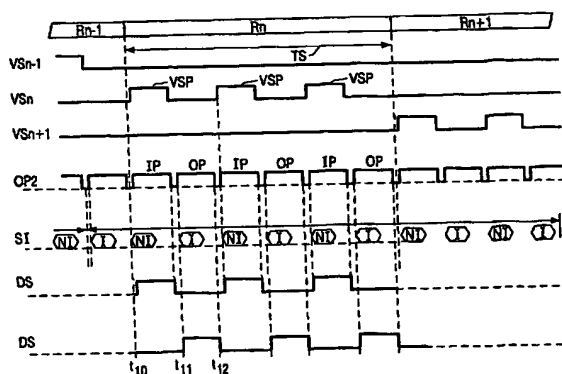
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(57) Abstract: A driver circuit drives an electroluminescent display (1) which comprises a matrix of display pixels (10) associated with intersections of data electrodes (12) and select electrodes (11). The driver circuit comprises a select driver (2) which supplies a select signal (VS) comprising non-overlapping select pulses (VSP) with a predetermined repetition frequency to a selected one (11') of the select electrodes (11). The data driver (3) supplies data signals (DS) comprising data pulses (DSP) with the same predetermined repetition frequency to the data electrodes (12). The data pulses (DSP) occur during the select pulses (VSP) for data electrodes (12) of which associated pixels (10) should not produce light. The data pulses (DSP) occur in-between the select pulses (VSP) for data electrodes (12) of which associated pixels (10) should produce light.



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European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G09G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 072 619 A (ZAIDENBERG LEV ET AL) 6 June 2000 (2000-06-06) cited in the application column 6, line 3 - line 6; figure 1	1
A	US 6 249 279 B1 (SHIRASAWA HIROSHI) 19 June 2001 (2001-06-19) cited in the application paragraphs '0019!-'0023!	2
X	EP 0 454 470 A (SHARP KK) 30 October 1991 (1991-10-30) page 7, line 24 - line 26; figures 4,5 page 7, line 29 - line 36 page 8, line 26 - line 34 --- -/--	1,7,8

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 5 081 400 A (WEBER LARRY F ET AL) 14 January 1992 (1992-01-14) figures 5,6</p>	2

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/IB 03/03264

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6072619	A	06-06-2000	AU 3893600 A	09-10-2000
			CA 2363005 A1	28-09-2000
			CN 1344379 T	10-04-2002
			EP 1171795 A1	16-01-2002
			JP 2002540457 T	26-11-2002
			TR 200102390 T2	21-12-2001
			WO 0057238 A1	28-09-2000
US 6249279	B1	19-06-2001	JP 3070553 B2	31-07-2000
			JP 11161218 A	18-06-1999
			EP 0919983 A2	02-06-1999
			TW 473700 B	21-01-2002
EP 0454470	A	30-10-1991	JP 2682886 B2	26-11-1997
			JP 4007592 A	10-01-1992
			EP 0454470 A2	30-10-1991
			US 5206631 A	27-04-1993
US 5081400	A	14-01-1992	US 4866349 A	12-09-1989
			CA 1306815 C	25-08-1992
			DE 3752035 D1	24-04-1997
			DE 3752035 T2	16-10-1997
			DE 3788766 D1	24-02-1994
			DE 3788766 T2	19-05-1994
			EP 0261584 A2	30-03-1988
			EP 0548051 A2	23-06-1993
			JP 2801907 B2	21-09-1998
			JP 9325732 A	16-12-1997
			JP 2866073 B2	08-03-1999
			JP 9325733 A	16-12-1997
			JP 2866074 B2	08-03-1999
			JP 9325734 A	16-12-1997
			JP 2801908 B2	21-09-1998
			JP 10011019 A	16-01-1998
			JP 7109542 B	22-11-1995
			JP 63101897 A	06-05-1988
			JP 3117680 B2	18-12-2000
			JP 11242458 A	07-09-1999